





### High Definition Documentation of Archaeology NCPTT Grant Number: MT-2210-06-NC-06

Today the world is losing its architectural and archaeological cultural heritage faster than it can be documented.

The Getty Conservation Institute

### **Narrative Description**

Documentation has always played a primary role in archaeology and historic preservation. Rarely is an archaeological or preservation project is ever undertaken without documentation. Until recently, documentation has typically been a manual operation, highly time consuming and costly. Yet, with advances in survey technology, primarily with the introduction of 3D laser scanning and global positioning systems, and in photography with new high resolution and high dynamic range methods, there now are great opportunities to revolutionize the documentation of our cherished cultural heritage sites.

With the application of these new technologies and methods, the time spent documenting existing conditions of archaeological sites and structures can now be cut by 60% and result in improved accuracy and fidelity of the documentation deliverables. Integrating these technologies and methods into a High Definition Documentation (HDD) methodology is optimizing valuable human and financial resources for archaeologists and preservation specialists working to save America's 'Vanishing Treasures'.

Texas Tech University, College of Architecture (TTU) and CyArk a nonprofit cultural heritage project of the Kacyra Family Foundation (CyArk) teamed with the National Center for Preservation Technology and Training (NCPTT) to present the most current developments in High Definition Documentation (HDD) to Mesa Verde National Park (MEVE) and the National Park Service (NPS). TTU held a presentation and a two week on-site training workshop on HDD at Mesa Verde National Park for staff and administrators of the Vanishing Treasures program. In addition, TTU and CyArk conducted a 2 day webinar on HDD for the National Park Service and invited guests from around the world.

The training workshop was held on May 2007 at Mesa Verde National Park and gave hands-on experience with HDD technologies to over 20 National Park Service employees. This experience included on-site field data collection at the Fire Temple cliff dwelling using 3D laser scanning, GPS surveying and high resolution digital photography. The workshop participants also engaged in hands-on data processing of the data collected on site. They created a variety of media from the data collected including 2D archaeological maps and interpretive media such as panoramas. TTU also gave a 2 day seminar on the principles, concepts and methods of HDD for staff and







administrative executives from MEVE and other visiting parks. During the workshop, both TTU and CyArk gave presentations to cultural heritage dignitaries from the U.S. and Mexico attending the "Heritage Without Borders" Sister Parks conference organized by the President's Committee for Arts and the Humanities.

The data collected at Fire Temple has been processed into a variety of media deliverables, such as Level 2 archaeological maps, including a site plan map and several site sections. Maps of every surface on the site were developed from the 3D laser scan data with information that includes surface boundary, large features and openings. Ten of these surface maps were developed to a Level 1 status, using the scan data and photogrammetry techniques. TTU also processed 4 high dynamic range (HDR) panoramas of the site, and a low polygon virtual representation. CyArk has archived this data and additional data from Fire Temple created by CyArk on its open access Internet archive, the CyArk 3D Heritage Archive, <a href="https://www.cyark.org">www.cyark.org</a>.

On November 14-15, 2007 TTU and CyArk, with NCPTT, conducted a webinar on HDD, using the results from workshop held at MEVE. The webinar was attended by over 90 cultural heritage professionals who came from the National Park Service, universities, and cultural heritage institutions from around the world

The sum total of these activities was very successful in raising awareness and understanding among National Park Service and other preservation professionals about HDD and its role in the more efficient and more accurate documentation of archaeological and other cultural heritage sites. It was demonstrated that very detailed and accurate archaeological documents could be developed with a significant reduction of time and labor over conventional means, and that the HDD process produces additional interpretive products, such as geometric models, panoramic photographs, and geo-referenced maps. It was also demonstrated how such digital data could be easily organized, archived, retrieved and used in meaningful ways. HDD brings many benefits to archaeology and historic preservation. HDD also brings benefits to education. Now with the maps, CAD drawings, photographs, panoramas, and animations from Fire Temple archived on the CyArk 3D Heritage Archive, TTU, CyArk and NCPTT have provided the public with an open access resource, a wealth of visually rich materials to better learn about the heritage of the ancient peoples of Mesa Verde National Park.







### FINAL REPORT

For

Grant Number: MT-2210-06-NC-06

By: Glenn Hill, College of Architecture, Texas Tech University

Date: December 21, 2007

### 1. Institution/Organization:

1.12. College of Architecture at Texas Tech University (TTU) as subcontracted by Kacyra Family Foundation

### 2. Project Title:

2.12. High Definition Documentation of Archaeology

### 3. Grant Number:

3.12. MT-2210-06-NC-06. Subcontract: 1354-44- C829

### 4. Grant Amendments.

4.12. The project objectives were amended whereby the three one-day demonstration workshops at Vanishing Treasures parks were replaced with one two day Webinar presented by TTU, CyArk, and NCPTT. As per email conversations dated 14-15 August 2007 with Dr. David Morgan. (See Appendix A)

### 5. Work Performed and Results:

- 5.12. The College of Architecture at Texas Tech University (TTU) has completed 100% of the work associated with the project. The following is a list of the tasks executed in performance of the grant and a short description of the work performed.
- 5.13. <u>August 2006 Site Visit to MEVE and HDD data collection.</u> ( TTU, August 2006).
  - 5.13.1. Meetings were held with MEVE personnel for the planning of the HDD Workshop in May 2007. Additional scanning and site data was taken of Spruce Tree House at this time. This additional HDD data collected from the scanning and photography was used in research to produce the methodology taught in the HDD Workshop. Methods for delivering Level 2 and Level 1 architectural mapping with the detail features and panoramas of the site were refined. Dr. Eric Sinzinger and his graduate students have been working on methods to manipulate point cloud data to produce 2D archaeological maps of circular structures. Initial success has been achieved and development is still ongoing.







- 5.14. <u>Dimensional Accuracy Analysis of Level 1 Architectural Mapping.</u> (TTU, September thru November 2006).
  - 5.14.1. Ananta Patel (TTU graduate student) and Glenn Hill conducted a comparison analysis of Level -1 architectural maps created by different methods. Comparisons were made of MEVE CAD drawings, MEVE field sketches, and CyArk CAD drawings of Room #15 at Spruce Tree House using control dimensions from the site. The MEVE documents were derivatives of conventional documentation. The CyArk documents were derivatives of HDD. The comparison demonstrated that when taking into account the inherent ambiguities of line choice by the draftsperson or CAD operator, there exists relative accuracy among the methods when observed on site. An internal report was submitted.
  - 5.14.2. Previous comparison analysis by CyArk demonstrated a dimensional drift between CAD data derived from conventional documentation and CAD data derived from HDD. This drift commenced around eye level and increased upward.
  - 5.14.3. While the dimensional accuracy of HDD is inherently more precise then dimensions obtained manually, human choice in the creation of 2D derivative documents may result documents that are relatively equal or different in accuracy, not reflecting the full 3D precision of the HDD core data.
- 5.15. <u>Determining an appropriate site at Mesa Verde National Park for the MEVE HDD Workshop.</u> (TTU, August 2006)
  - 5.15.1. This consisted of finding a site that would be small enough to be completely documented within 10 days of the workshop, as well be readily accessible on a daily basis by the different the workshop participants. It was determined that Fire Temple met these requirements and had some significant features that would be a good challenge for documentation, such as the 30' of pictographs and circular and rectilinear structures.
- 5.16. <u>Planning and organizing the MEVE HDD Workshop.</u> (TTU, August 2006 thru April 2007).
  - 5.16.1. Glenn Hill worked with MEVE personnel in the management, planning, coordination and scheduling. Chris Snowden (ARDC, Manager of Technology), Anant Patel (TTU graduate student) and Glenn Hill worked on content and curriculum development, for the MEVE HDD Workshop.
- 5.17. <u>Preparation of the MEVE HDD Workshop Lessons.</u> (TTU, October 2006 March 2007).
  - 5.17.1. Lesson plans and teaching materials for the MEVE HDD Workshop were developed at Texas Tech by Chris Snowden, Anant Patel and







Glenn Hill. Materials developed included lectures, tutorials, demonstrations and handouts. Handouts were developed on HDD methods, techniques and procedures, such as 3D laser scanning, optical surveying, GPS, high resolution digital photography. Other handouts included data processing methods such as point cloud registration, meshing, mapping, photogrammetry, and panoramic processing. Many of these procedures have been documented in short videos. Texas Tech is also developing a HDD wiki where people will be able to access this information and update it as needed.

- 5.18. Preparation of HDD Seminar and Workshop. (TTU, April 2007 March 2007).
  5.18.1. A series of work sessions were held with the workshop team to develop final presentation format, content and schedule. This included discussion on the theory, principles and concept of HDD; field work process & procedure; and HDD digital data processing and procedures.
- 5.19. <u>Information and computing technology acquisition, management and preparation.</u> (TTU, April 2007)
  - 5.19.1. Five laptops were prepared for use during the MEVE HDD Workshop. This included installation of software, requests to vendors for temporary software licenses, and on-site management of computers to keep them operational during the workshop. This was the most difficult part of the workshop to manage. The isolation of the park and the unavailability of high speed internet made it difficult and time consuming to troubleshoot on-site issues with software.
- 5.20. <u>Identification, acquisition, organization, preparation and testing of HDD equipment and peripherals.</u> (TTU, February 2007 April 2007)
  - 5.20.1. Chris Snowden insured the performance and readiness of all the equipment, and checked the equipment extensively before leaving for the workshop. This included 3D laser scanner, photographic equipment, survey equipment, GPS and ancillary equipment needed to teach the workshop.
- 5.21. Pre workshop site evaluation and testing. (May 5 8th 2007).
  - 5.21.1. Christopher Snowden and Ananta Patel spent three days on site prior to the workshop to set up the survey control grid, transport equipment, and coordinate logistics with park staff. Setting up the survey control grid included establishing a GPS control point (secondary survey control) and optical surveying of Fire Temple to establish known points for survey network.
- 5.22. <u>Training Workshops for MEVE personnel on HDD methods and procedures.</u> (TTU, 100% complete) (May 7 thru May 19, 2007)







- 5.22.1. The 2 week training workshop at MEVE included a two day overview presentation and demonstration, and four-four day workshop sessions. Four 4 day HDD training workshops were held in the field at Fire Temple, MEVE from May 9 thru May 19. Each four day workshop session consisted of two components. Each workshop session had 3-4 participants. During the first two days of these workshop sessions, participants had field demonstration and handson experience with surveying, digital photograph, panoramic photography, and 3d laser scanning. Each group collected a portion of the HDD site data of Fire Temple. The data they collected was used in a following two day computer lab session, where they were taught how to process the data into 2D archaeological maps, high dynamic range photographs and panoramas.
- 5.22.2. Two day HDD Overview Seminar. (7th May 2007 8th May 2007). A two day Overview Session on HDD was held on May 7 & 8, 2007. This session was an introduction to HDD and the technologies that are used in the process. It was comprehensive overview with demonstrations of technology. All of the training workshop participants attended, as well as administrators and staff from MEVE and other nearby parks. There were approximately 25-30 participants at any one time. The content of this Overview Session was used as the basis for the Webinar (See 5.b)
- 5.22.3. Two Weeks of onsite field instruction at MEVE. (9th May 2007 19th May 2007) Each of the 4 person teams spent 2 days on site (Fire Temple) learning HDD field procedures. This consisted of giving hands-on training with all of the HDD equipment to 4 separate teams of NPS employees. Each team learned how to perform the following HDD tasks:
  - ✓ Set-up, scan and survey targets used to established control grid.
  - ✓ Set-up and operate the 3D scanner. Each member of the team was able to do this at least once.
  - ✓ Set-up, configure and operate the high resolution digital camera to take panoramic and mosaic photographs for interpretation, documentation and mapping purposes.
- 5.22.4. Two Weeks of HDD Lab Workshop. (9th May, 2007 19th May, 2007)
  During the workshop each of the team members had 2 days in a computer training session. They used the HDD data collected in the field and learned to operate the different software needed for data management, point cloud editing and registration, creating maps from scan data, meshing the scan data, applying photogrammetry and creating panoramas.
- 5.22.5. Texas Tech gave 4 workshop sessions over a two week period to 12 participants.
- 5.22.6. During the workshop period, both Glenn Hill of TTU and John Loomis of CyArk gave presentations to cultural heritage dignitaries from the







U.S. and Mexico attending the "Heritage Without Borders" Sister Parks conference organized by the President's Committee for Arts and the Humanities.

### 5.23. Webinar on HDD methods and procedures to the National Park Service. (October - November 2007)

- 5.23.1. As per email conversations dated 14-15 August 2007, TTU and CyArk agreed to conduct a webinar in lieu of the three demonstration workshops.
- 5.23.2. The webinar was held over a two day period of November 14-15, 2007. The webinar consisted of one 3 hour session on each day.
- 5.23.3. Session 1 on the 14<sup>th</sup> of November, conducted by Glenn Hill and Chris Snowden of TTU covered a) conceptual overview of HDD technology and methods; b) Global Positioning Systems and Surveying; and c) 3D laser scanning. Each of these presentations was followed by a question and answer period. The quality of the questions was very good and showed that the participants were engaged in the materials being presented.
- 5.23.4. Session 2 on 15<sup>th</sup> of November, conducted by Glenn Hill and Chris Snowden of TTU and Elizabeth Lee of CyArk covered a) digital, high dynamic range and panoramic photography; b) photogrammetry techniques with 3D laser data; and c) 2d map generation from 3d laser data and photogrammetry. d) archiving and data management over the Internet via CyArk Site Manager web application software. Both sessions used case studies of HDD projects at the Statue of Liberty and Fire Temple at MEVE.
- 5.23.5. There were approximately 91 attendees from all over the United States and several foreign countries. (See Appendix A)

### 5.24. HDD of an entire cliff dwelling site.

- 5.24.1. 3D laser scan, high definition digital photography, geo-reference of entire dataset, survey control of site were all executed at Fire Temple.
- 5.24.2. The data collection was completed during the MEVE Training Workshops held between May 4th to May 19th. Portions of data set were actually collected twice, because the first two teams collected data for the entire site and therefore the process was repeated a second time.
- 5.24.3. This data was later used by TTU to generate documentation assets of the site, and was delivered to CyArk, who in addition processed the data for posting on CyArk cultural heritage website, www.cyark.org.

### 5.25. <u>Level 2 and Level 1 documentation.</u> (May 2007 – July 2007)

5.25.1. The HDD scan data collected at Fire Temple during the workshop has been completely registered. The point clouds are used to create









Level 2 architectural maps for MEVE (outline plans and wall elevations). The point cloud was also converted into a polygonal mesh and some of the high res photographs were rectified to the maps. These rectified photographs (photogrammetry) have been used to create Level 1 architectural maps using AutoCAD. TTU has completed all Level 2 maps for Fire Temple and a series of Level 1 maps for evaluation of the High Definition Documentation. These documents were created to prove that such maps could be created from the data set and to determine the time it would take to create them. These maps include no archaeological notations and these documents have not been reviewed or approved by MEVE archaeologists. (See Appendix B for examples).

- 5.26. <u>Virtual Interpretation High resolution panoramas of site.</u> (May 2007 July 2007)
  - 5.26.1. Multiple exposure brackets of high resolution images were taken during the Workshop using panoramic photography. From these images High Dynamic Range panoramic images of the site were processed. These panoramas were delivered to CyArk and they have been archived on the open access CyArk 3D Heritage Archive, www.cyark.org. They are also available for distribution by NCPTT or MEVE.
- 5.27. <u>Three dimensional real-time walk-thru of a portion of the site.</u> (September 2007).
  - 5.27.1. A digital geometric model of Fire Temple was developed from the scan data. The scan data was converted into a polygonal mesh model then ported to a real-time walk-thru editor. It has been ported to two real-time platforms 1) EON Reality and 2) Unreal 3. The walk-thru includes geometry with no texture maps. TTU plans on further development of this real-time model.

### 6. Conclusion:

6.12. High Definition Documentation Archaeology at Mesa Verde National Park has been a very successful project. MEVE now has a new, comprehensive, and highly accurate data set documenting Fire Temple that will be a valuable cultural resource management tool for years to come. Nevertheless, it was the training workshops that were the primary object of the project. They were well attended, with over 20 participants at any one time. The trainees were enthusiastic, and the feedback received was very positive. Many of the participants picked up the field data collection process so quickly they felt they could have spent less time in the field. Data processing was a little more challenging, but the participants fortunately had adequate computer skills such that learning these methods was not overly challenging. Of course, the workshop was not intended to make them experts in the process, but to build

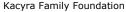






their awareness and understanding of HDD so they can begin to make informed decisions. It is evident from the work that TTU and CyArk have done using HDD, that this procedure will be an expanding part of the documentation of cultural heritage, whether it is archaeology or architecture. Building awareness and understanding of HDD methodology is a critical step towards it's adoption by NPS as best practice for archaeological and architectural documentation. High Definition Documentation Archaeology at Mesa Verde National Park has more that achieved this step.

- 6.13. The webinar was a very good addition to the project. Had the three one day seminars at the Vanishing Treasures parks been conducted as originally planned, only at best 10 people would have received training at each presentation. However, with the webinar over 150 people registered for the two day webinar and over 90 people were in attendance over the two days. The reach of the webinar was significant, and beyond expectations, since the notice for it went out only 3 weeks in advance to emailing lists of National Park Service, CyArk, and TTU College of Architecture. The achieved scope of the outreach was much greater than ever anticipated, demonstrating a high level of interest in learning about HDD. This webinar clearly addressed a need. Moreover, it must be noted that the achieved scope of the outreach was outstanding public relations for NCPTT, TTU, and CyArk. Because of the success of the webinar, a video recording of the webinar has been created. This is being produced beyond the scope of and in addition to the grant deliverables. It is TTU's plan to conduct additional webinars in the future on the separate methods of HDD such as laser scanning, photogrammetry and panoramas.
- 6.14. The only problem in completing the grant has been the lack of adequate funds. Because of the importance of this work Texas Tech University College of Architecture has absorbed the salaries of the three main investigators, which included Glenn Hill, Chris Snowden and Eric Sinzinger. The cause of this was a combination of creeping scope of work, the re-allocation of the original grant and the failure to find matching funds for the activities. CyArk also contributed much more time to the project than was originally anticipated and budgeted, and like TTU considers this a worthwhile contribution given the importance of the project mission.
- 6.15. Can HDD have significant impact on the efficiency and effectiveness of heritage documentation? From a general review of the experiences of TTU and CyArk at Spruce Tree House, Square Tower House, and now Fire Temple, HDD can deliver a time significant time savings in the range of 60% over conventional documentation methods.
- 6.16. More specifically, at Fire Temple the entire HDD dataset was collected over a period of six-8 hour days. This takes into account the two-half days to lower the equipment into the site and to raise it out; the half-day to set up the GPS control network and four and one-half days to do the data collection. Even though archaeological notations were not taken this is a significant accomplishment compared to the time it would have taken by conventional









means. HDD is a demonstrated faster means of documentation and previous work also demonstrates that HDD is greater or equal in accuracy to conventional methods of documentation. In addition, one person (Ananta Patel) working in a period of six weeks, was able to produce a set of Level 2 CAD maps of the site and large feature maps of every surface in the site from the scan data. He was also able to produce Level 1 architectural maps of 10 large wall surfaces, using scan data and photogrammetry techniques. It would not be unreasonable to project that two people working a summer season could document a site of similar size and detail. TTU plans to give a presentation of this work to MEVE and publish the results in 2008.

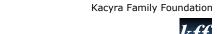
- 6.17. Additional assets have also been generated through this process, including such items as panoramas, animations, and 3D models that add value to the HDD. With the archiving of this all this data via the Internet on the open access CyArk 3D Heritage Archive, HDD core data deliverables and their derivatives go beyond serving archaeological and cultural resource management purposes. They become valuable educational resources for the general public.
- 6.18. Where do we go from here? There is still work to be done in the development of HDD. The methods and means of integrating archaeological notation into the process have not been adequately resolved. Though TTU has made some success in developing software applications to extract maps from circular and non-uniform structures there is still work that needs to be done here. The automation of this process is critical for ruins like the ones at MEVE.
- 6.19. Another pressing issue is historical archiving of digital data. CAD maps can be plotted out on archival quality media and put into files for future access. But the important field notes collected by the conventional process are imbedded in the digital media, which the method and means of 100 year archiving has yet to be fully resolved. Does this mean we should stop and wait for this to happen. The answer is no. The archiving of digital media can be reduced down to simple ASCI formats and other base data formats which are software and hardware independent. The field notes are being transferred and archived in relational databases at MEVE today. These formats are reconstructable and platform independent. It is evident from the efforts of TTU, CyArk, and some others that the issues above are very resolvable. There are a number of ideas, but it is going to take a combination time, work and funding to get them resolved. It has become increasing clear the investment is worth making.

Signature: Jenn E. Hill

Date: 18 December, 2007

Project Manager/Co-Investigator: Glenn E. Hill

Organization: Texas Tech University







| Signature:        |      |
|-------------------|------|
| Date: 20 December | 2007 |

Date: 20 December, 2007
Prime Contractor/Co-Investigator: <u>Barbara Kacyra, President</u>
Organization: <u>CyArk / Kacyra Family Foundation</u>



# Webinar Performance Report: High Definition Documentation for Archaeology and Architecture (Day 1)

### **General Information**

| Date                 | Start Time  | Scheduled Duration | <b>Actual Duration</b> |
|----------------------|-------------|--------------------|------------------------|
| Wed, Nov 14,<br>2007 | 6:43 AM PDT | 180 Mins           | 205.38 Mins            |

### Registrants/Attendees

| Registered | Opened<br>Invitation | Clicked Registration Link | Total Attended |
|------------|----------------------|---------------------------|----------------|
| 156        | 25*                  | 563                       | 114            |

<sup>\*</sup> Only emails sent in HTML can be tracked.

### **Attendance Profile**

| Time     | Number of<br>Attendees | Percentage of Total<br>Attended |
|----------|------------------------|---------------------------------|
| 6:58 AM  | 31                     | 27.19%                          |
| 7:13 AM  | 75                     | 65.79%                          |
| 7:28 AM  | 85                     | 74.56%                          |
| 7:43 AM  | 82                     | 71.93%                          |
| 7:58 AM  | 84                     | 73.68%                          |
| 8:13 AM  | 84                     | 73.68%                          |
| 8:28 AM  | 87                     | 76.32%                          |
| 8:43 AM  | 85                     | 74.56%                          |
| 8:58 AM  | 80                     | 70.18%                          |
| 9:13 AM  | 78                     | 68.42%                          |
| 9:28 AM  | 78                     | 68.42%                          |
| 9:43 AM  | 77                     | 67.54%                          |
| 9:58 AM  | 65                     | 57.02%                          |
| 10:08 AM | 42                     | 36.84%                          |

| Average Attendance Duration | 132.13<br>Minutes |
|-----------------------------|-------------------|
|-----------------------------|-------------------|

<sup>\*</sup> Indicates Peak Number of Attendees.

### **Attendee Feedback**

Q & A Questions Asked 85



## Webinar Performance Report: High Definition Documentation for Archaeology and Architecture (Day 2)

Report information is updated every two hours

Last Update: Dec 16 2007 16:57:09

### **General Information**

| Date                 | Start Time  | <b>Scheduled Duration</b> | <b>Actual Duration</b> |
|----------------------|-------------|---------------------------|------------------------|
| Thu, Nov 15,<br>2007 | 6:42 AM PDT | 180 Mins                  | 215.85 Mins            |

### Registrants/Attendees

| Registered | Opened<br>Invitation | Clicked Registration Link | Total Attended |
|------------|----------------------|---------------------------|----------------|
| 150        | 9*                   | 330                       | 91             |

<sup>\*</sup> Only emails sent in HTML can be tracked.

### **Attendance Profile**

| Time     | Number of<br>Attendees | Percentage of Total<br>Attended |
|----------|------------------------|---------------------------------|
| 6:57 AM  | 22                     | 24.18%                          |
| 7:12 AM  | 66                     | 72.53%                          |
| 7:27 AM  | 75                     | 82.42%                          |
| 7:42 AM  | 75                     | 82.42%                          |
| 7:57 AM  | 75                     | 82.42%                          |
| 8:12 AM  | 76                     | 83.52%                          |
| 8:27 AM  | 72                     | 79.12%                          |
| 8:42 AM  | 71                     | 78.02%                          |
| 8:57 AM  | 72                     | 79.12%                          |
| 9:12 AM  | 65                     | 71.43%                          |
| 9:27 AM  | 61                     | 67.03%                          |
| 9:42 AM  | 58                     | 63.74%                          |
| 9:57 AM  | 51                     | 56.04%                          |
| 10:12 AM | 42                     | 46.15%                          |
| 10:18 AM | 32                     | 35.16%                          |
|          |                        | 145 99                          |

| Average Attendance Duration | 145.99<br>Minutes |
|-----------------------------|-------------------|
|                             |                   |

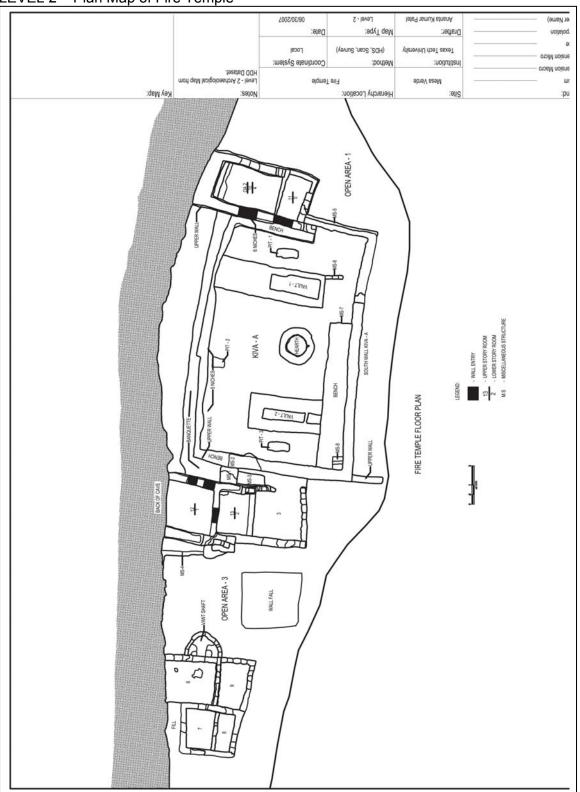
<sup>\*</sup> Indicates Peak Number of Attendees.

### **Attendee Feedback**

Q & A Questions Asked 67



LEVEL 2 – Plan Map of Fire Temple





LEVEL 1 Surface Map at Fire Temple

